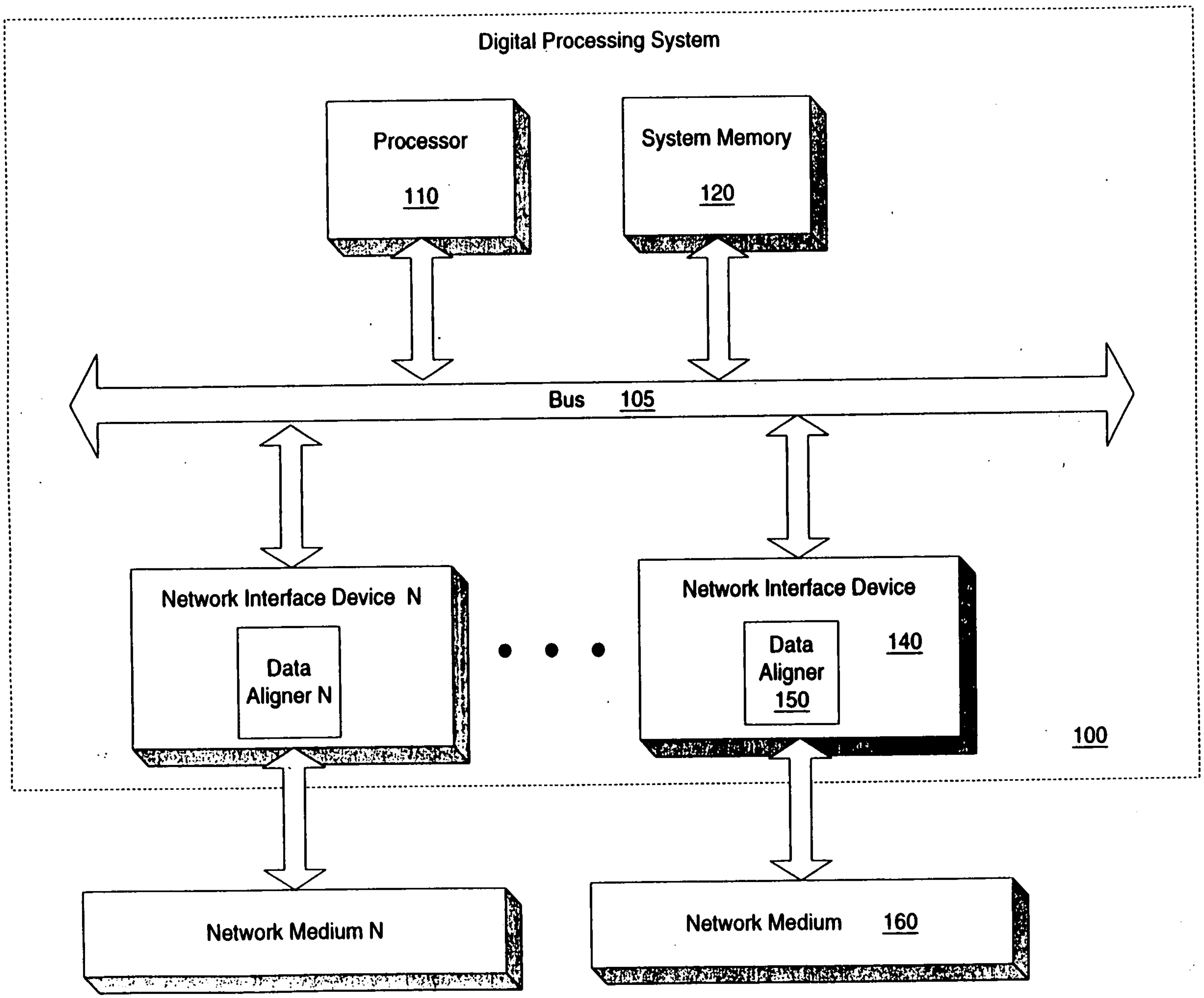

Digital Processing System
Processor
110
System Memory
120
Bus 105
Network Interface Device N
Data
Aligner N
Network Interface Device
Data
Aligner
150
140
100
Network Medium N
Network Medium 160

Figure 1

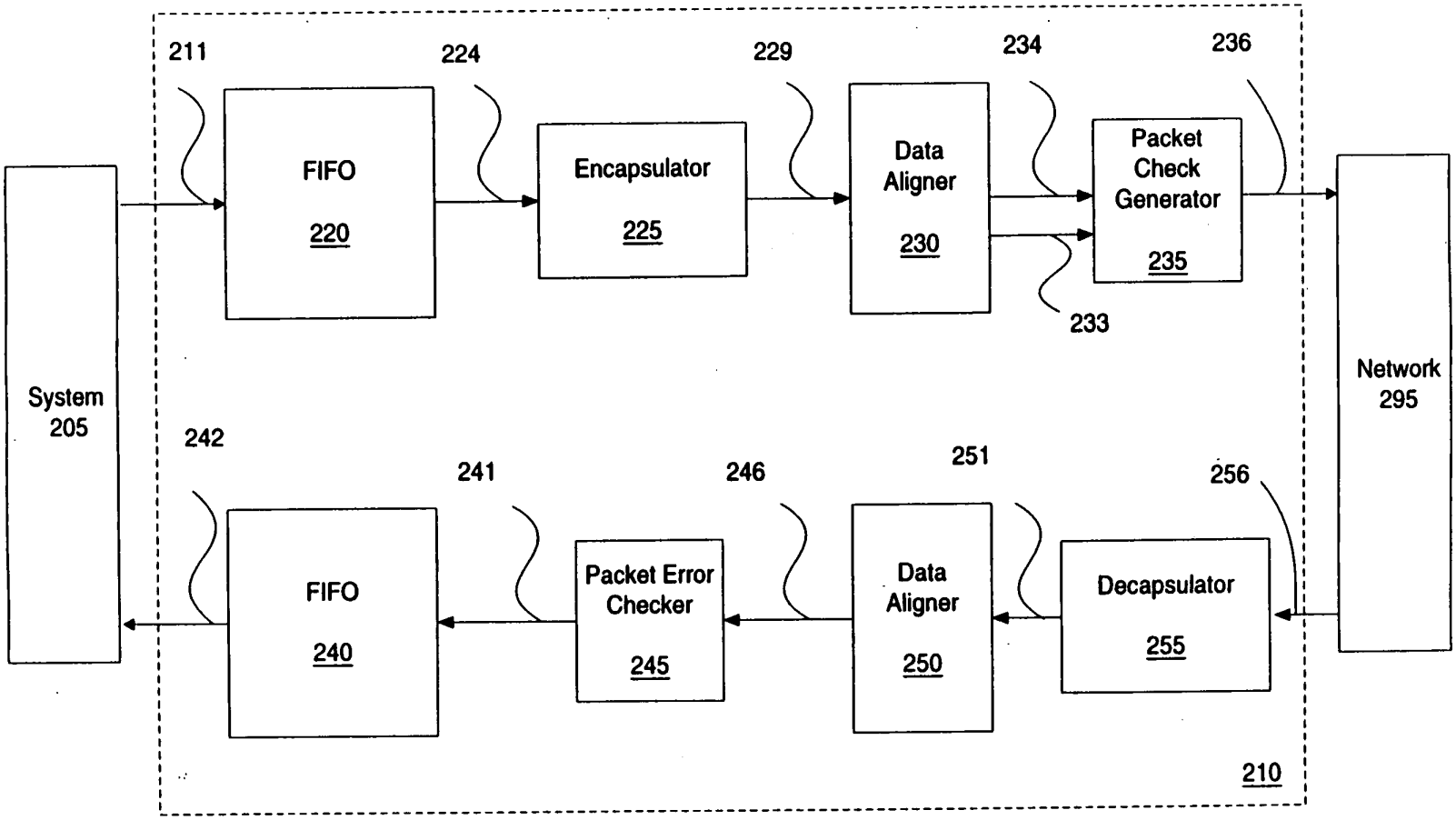


Figure 2

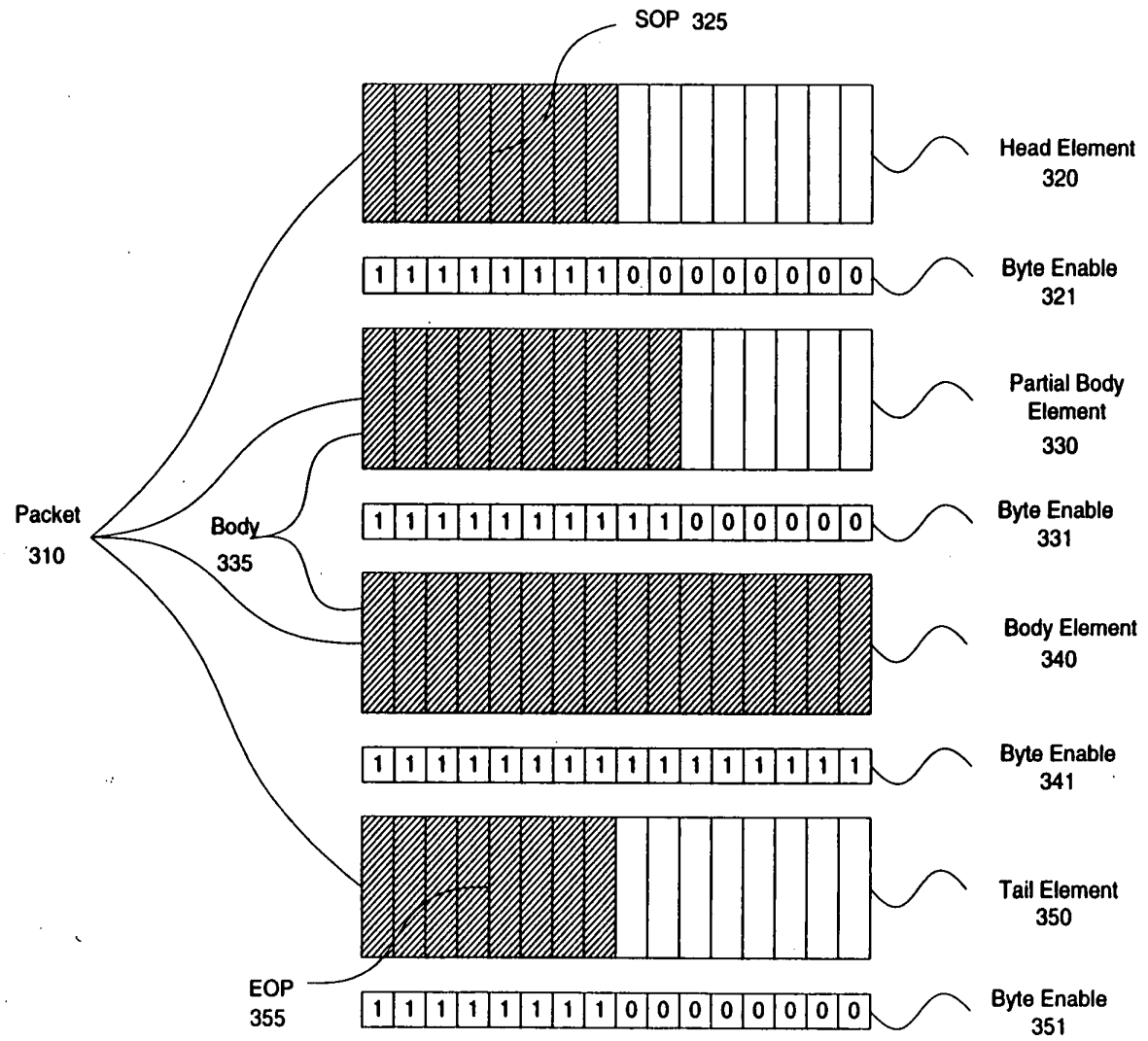

SOP 325
Head Element 320
1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
Byte Enable 321
Partial Body Element 330
1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0
Byte Enable 331
Body Element 340
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Byte Enable 341
Tail Element 350
1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
Byte Enable 351
Packet 310
Body 335
EOP 355

Figure 3

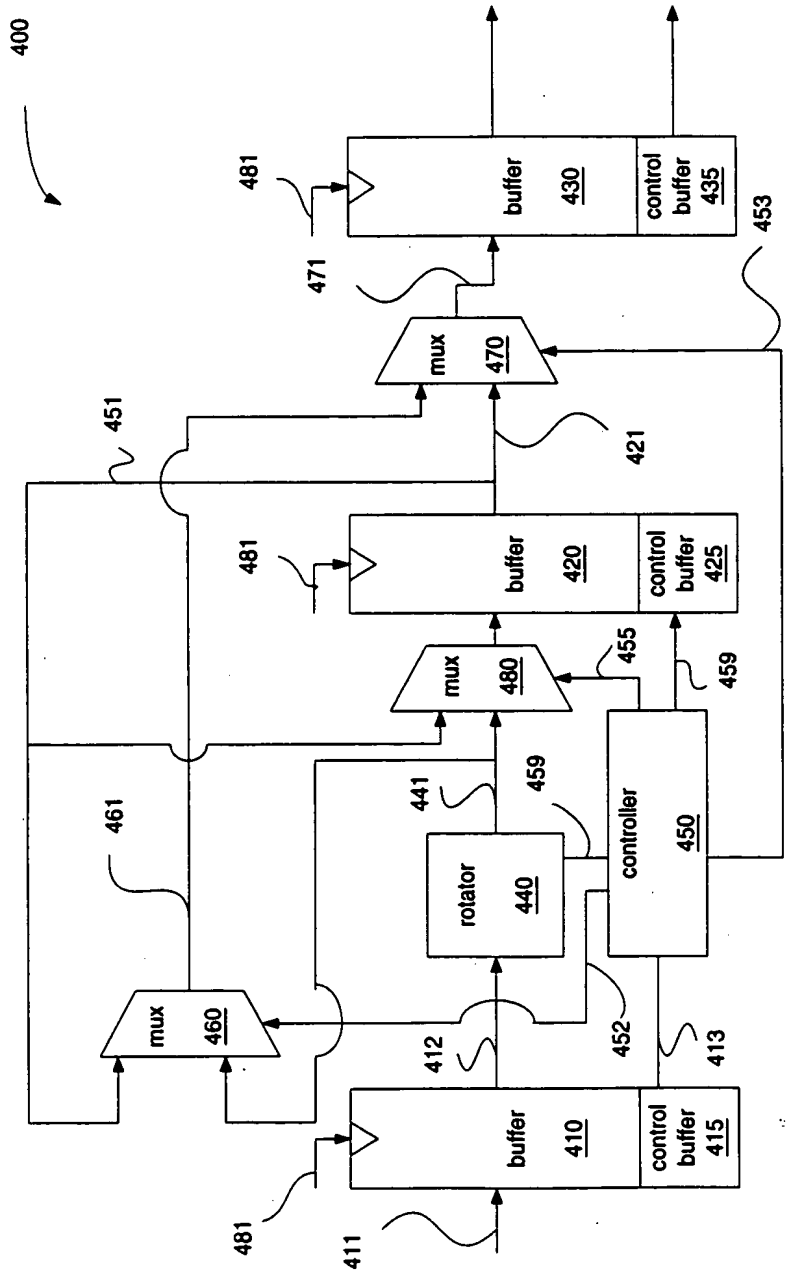
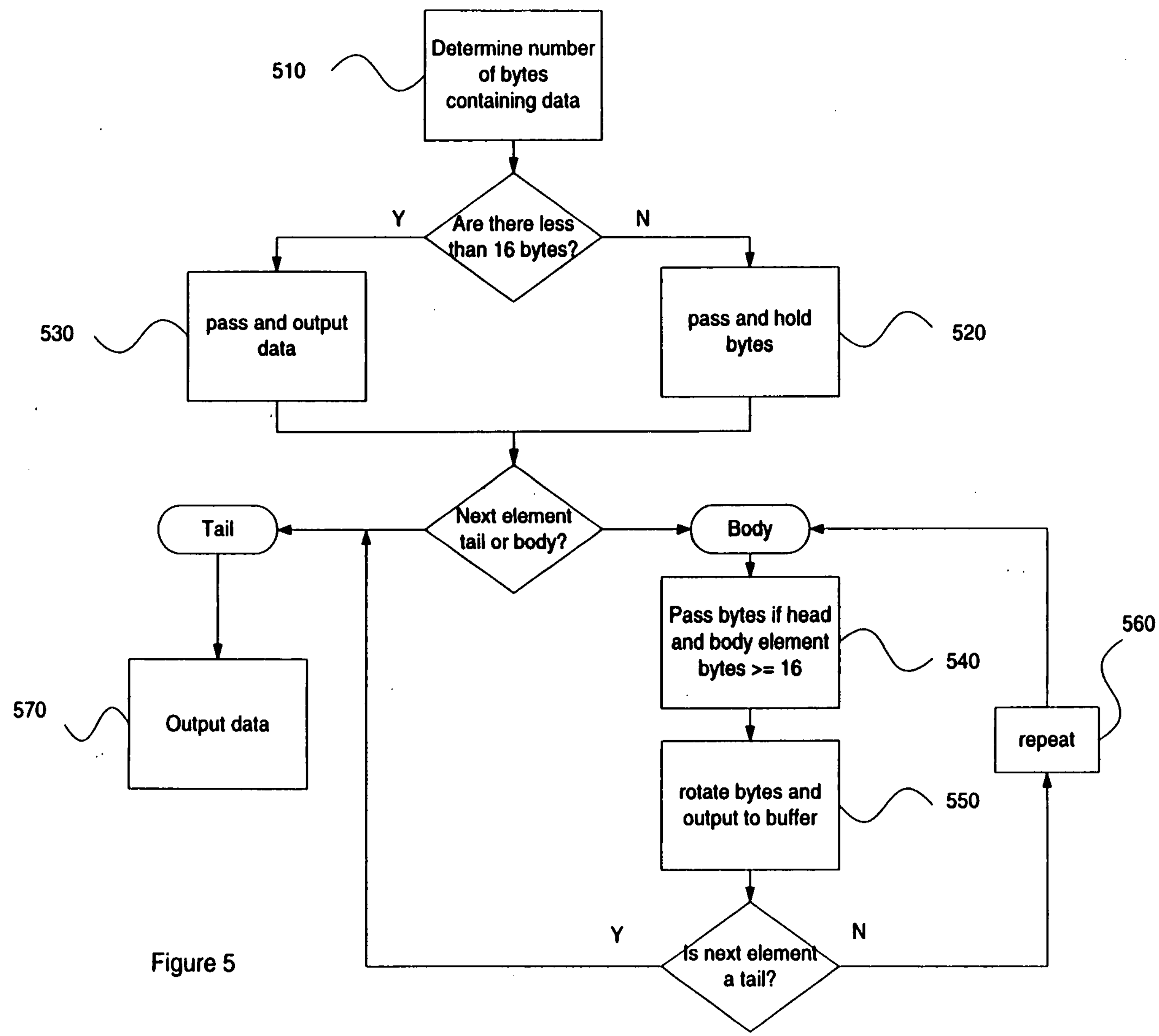

400
buffer 410
control buffer 415
buffer 420
control buffer 425
buffer 430
control buffer 435
mux 460
mux 470
mux 480
rotator 440
controller 450
411
412
413
441
451
452
453
455
459
461
471
481
404
406

Figure 4



Determine number of bytes containing data
510
Are there less than 16 bytes?
Y
N
pass and output data
530
pass and hold bytes
520
Next element tail or body?
Tail
Body
Pass bytes if head and body element bytes >= 16
540
rotate bytes and output to buffer
550
Is next element a tail?
Y
N
repeat
560
Output data
570

Figure 5

	Complex Data stream Element	Mapped Data stream Element	Qualifier	Mapping Flow
610	Head	Head		Same sequence as in simple data stream
620	Body	Body		Same sequence as in simple data stream
630	Tail	Tail		Same sequence as in simple data stream
640	Hole	Hold		Hold state
650	Partial Body (Tail A)	Tail	Net Count <16	Follow tail sequence but: Suppress data aligner control output. Bypass intermediate buffer. Perform calculation using unpassed result.
660	Partial Body (Tail B)	Tail	Net Count >=16	Follow tail sequence but: Do not suppress byte enables, SOP. Suppress generation of EOP control signal. No bypass for computation.

Figure 6

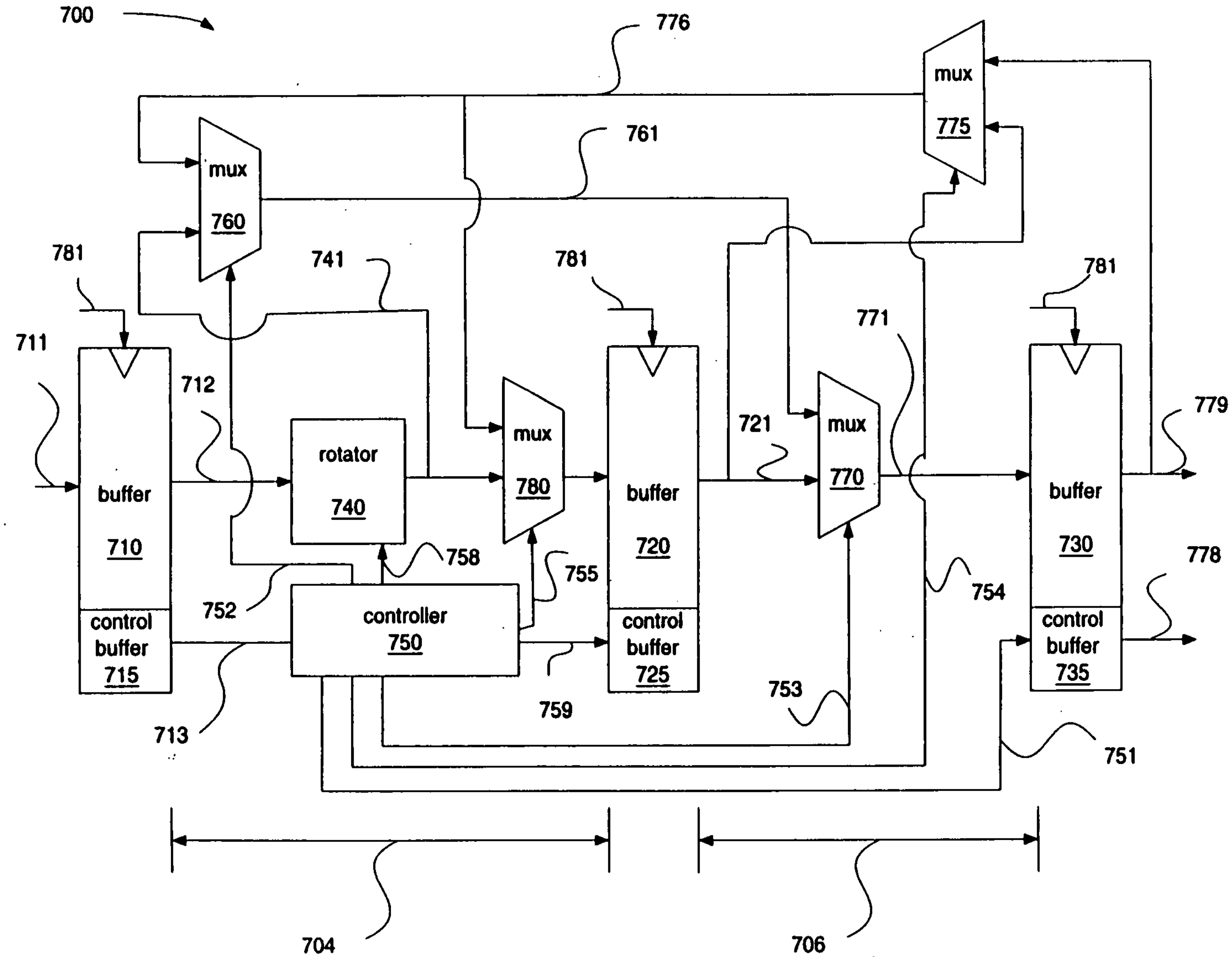

700
776
761
mux
775
mux
760
781
741
781
781
711
712
rotator
740
mux
780
buffer
720
771
721
mux
770
buffer
730
779
buffer
710
758
755
752
controller
750
control
buffer
715
control
buffer
725
control
buffer
735
754
778
713
759
753
751
704
706

Figure 7

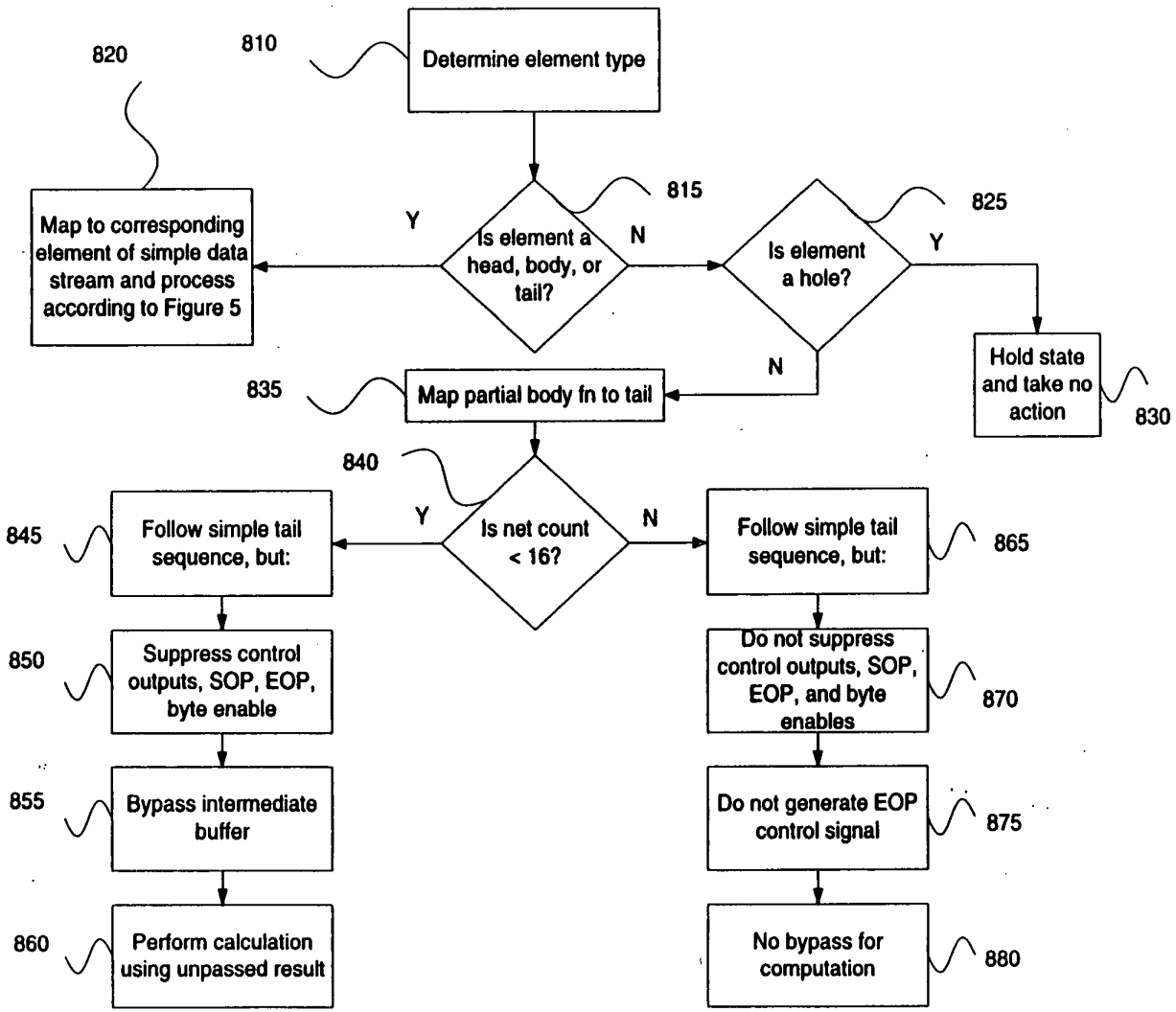

Determine element type
810
820
Map to corresponding element of simple data stream and process according to Figure 5
Y
Is element a head, body, or tail?
815
N
Is element a hole?
825
Y
Hold state and take no action
830
N
Map partial body fn to tail
835
840
Y
Is net count < 16?
N
845
Follow simple tail sequence, but:
Suppress control outputs, SOP, EOP, byte enable
850
Bypass intermediate buffer
855
Perform calculation using unpassed result
860
Follow simple tail sequence, but:
865
Do not suppress control outputs, SOP, EOP, and byte enables
870
Do not generate EOP control signal
875
No bypass for computation
880

Figure 8

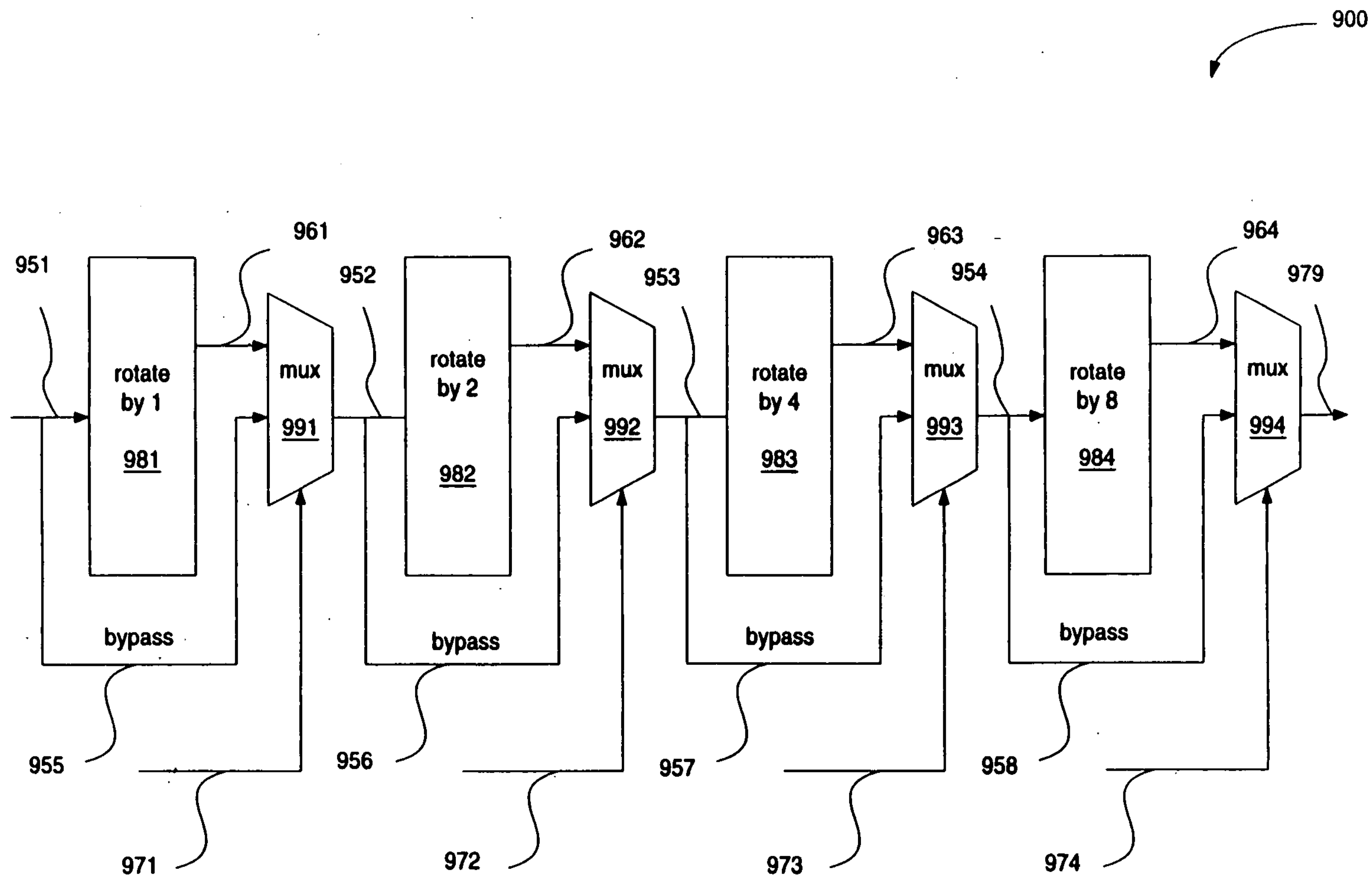

900
951
rotate
by 1
981
bypass
955
961
mux
991
971
952
rotate
by 2
982
bypass
956
962
mux
992
972
953
rotate
by 4
983
bypass
957
963
mux
993
973
954
rotate
by 8
984
bypass
958
964
mux
994
974
979

Figure 9

Serial Number	Shift Amount Value	Value of the Mux Control signal mxcntl[15:0]
1	4'b0000	16'b0000000000000000
2	4'b0001	16'b1000000000000000
3	4'b0010	16'b1100000000000000
4	4'b0011	16'b1110000000000000
5	4'b0100	16'b1111000000000000
6	4'b0101	16'b1111100000000000
7	4'b0110	16'b1111110000000000
8	4'b0111	16'b1111111000000000
9	4'b1000	16'b1111111100000000
10	4'b1001	16'b1111111110000000
11	4'b1010	16'b1111111111000000
12	4'b1011	16'b1111111111100000
13	4'b1100	16'b1111111111110000
14	4'b1101	16'b1111111111111000
15	4'b1110	16'b1111111111111100
16	4'b1111	16'b1111111111111110

FIGURE 10

Rotate_Amount	Input	Output
0	{ABCDEFGHIJKLMNOP}	{ABCDEFGHIJKLMNOP}
1	{ABCDEFGHIJKLMNOP}	{PABCDEFGHIJKLMNO}
2	{ABCDEFGHIJKLMNOP}	{OPABCDEFGHIJKLMN}
3	{ABCDEFGHIJKLMNOP}	{NOPABCDEFGHIJKLM}
4	{ABCDEFGHIJKLMNOP}	{MNOPABCDEFGHIJKL}
5	{ABCDEFGHIJKLMNOP}	{LMNOPABCDEFGHIJK}
6	{ABCDEFGHIJKLMNOP}	{KLMNOPABCDEFGHIJ}
7	{ABCDEFGHIJKLMNOP}	{JKLMNOPABCDEFGHI}
8	{ABCDEFGHIJKLMNOP}	{IJKLMNOPABCDEFGH}
9	{ABCDEFGHIJKLMNOP}	{HIJKLMNOPABCDEFG}
10	{ABCDEFGHIJKLMNOP}	{GHIJKLMNOPABCDEF}
11	{ABCDEFGHIJKLMNOP}	{FGHIJKLMNOPABCDE}
12	{ABCDEFGHIJKLMNOP}	{EFGHIJKLMNOPABCD }
13	{ABCDEFGHIJKLMNOP}	{DEFGHIJKLMNOPABC}
14	{ABCDEFGHIJKLMNOP}	{CDEFGHIJKLMNOPAB}
15	{ABCDEFGHIJKLMNOP}	{BCDEFGHIJKLMNOPA}

FIGURE 11